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A Systematic Review of Microplastic Detection in Water †

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The need to detect and mitigate the presence of microplastics in water has been the focus of both researchers and scientists recently due to their impact on humans and the environment. Microplastics (MPs) are pervasive pollutants that are almost always found in environmental settings, particularly in water. These are small fragments of polymers utilized to produce abrasives and exfoliants, or that appear as fragmented pieces from larger manufactured plastic products such as bottles and bags. They have been proven to cause not only health but also environmental problems as they heavily disrupt marine life and the ecosystem. Detection of not only the presence of microplastics in water but also the type of polymers present in water will further improve understanding and allow the development of preventive measures against the contamination of water and improvements in overall water quality. This systematic review paper aims to provide further insight into the various developments in the detection of microplastics suspended in water, the mechanism of detection, and the potential integration of different analytical instruments. These include the recent development of new and novel methods of detection, type, and sampling collection requirements, and optimization approaches. In addition, research gaps are identified to open avenues for researchers who want to venture into extended works related to the subject. Finally, the information presented in this paper will be beneficial for the improvement of existing MP detector equipment design, leading to more efficient performance.

Supplementary Materials: The presentation materials can be downloaded at: https://www.mdpi.com/article/10.3390/proceedings2024105150/s1.

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